

## TITLE OF INVENTION

### CHILD RESISTANT PACKAGE

## FIELD OF INVENTION

This invention relates to child resistant packaging (CRP) for household products especially pills and capsules. That is, safety packaging having features that make it difficult for most children to open yet is easily opened by most adults. While this invention is directed at products that require CRP it is not limited to these products.

## BACKGROUND OF THE INVENTION

The United States Consumer Product Safety Commission (CPSC) requires that certain products for household use be packaged in safety packaging or as it is commonly called child resistant packaging. Prescription drugs and certain over the counter (OTC) medications are among the products regulated. The child resistant packaging used for packaging pills and capsules in the U.S. is composed of reclosable packages consisting of containers and closures; and single use packages such as blister packs.

Most of the reclosable child resistant packages have a closure that has a sidewall depending from the periphery of the top panel. This closure sidewall is gripped by the consumer during the process of removing and or replacing of the closure from the container. While this sidewall is essential for operation of all of this type of child resistant packaging, it also provides children with a surface that they can grip with their hands or teeth to remove the closure from the container.

One such package consisting of a container and a closure with sidewall is shown in patent #5,711,442 issued to Kusz. This particular package has an exposed sidewall intended to be gripped by the consumer to rotate the closure while opening or closing the package. An appendage on the side of the container provides the child resistant feature and must be manipulated to allow the closure to be rotated for removal.

Another type of child resistant packaging has a plug style closure that requires the use of a unique tool to remove the plug from the container. One such package is shown in patent #5,437,382 issued to Gluckman. This patent depicts a container, a plug, and a closure. The closure is threaded on the container covering its mouth, while the plug is threaded

into the mouth of the container to a position below its top plane. The closure also has a tool integral with its top surface. To open the package one must remove the closure, invert it, insert it into the container opening, and rotate it to align the tool with plug, and unscrew the plug from the container. A disadvantage of this package is that a consumer could close the package by merely replacing the closure, but not the plug, thus having a package that is not in its original child resistant state.

#### BRIEF SUMMARY OF THE INVENTION

The object of the present invention is to provide a child resistant reclosable package consisting of two parts, a container and a closure, that depends upon the differences in cognitive skills between adults and young children to be effective. This package is child resistant because of its unique design that does not have an exposed area on the closure that can be gripped when the closure is properly applied on the container. The closure top surface is the only area of the closure that is exposed on this package. Most children lack the cognitive skill necessary to comprehend and act out a method for opening this type of package while most adults can easily accomplish this with minimal written or pictorial instruction. This will become obvious as one becomes familiar with the design and operation of this package.

The container is anticipated to look like a vial composed of a generally cylindrical sidewall with an integral bottom at one end and an opening at the end opposite the bottom. The closure is composed of a top panel, that preferably has a convex top surface, and a depending sidewall that is meant to be inserted into the container. When the package is closed the closure top panel is slightly above, below, or at the plane of the container opening; thus having little or no side surface exposed. Existing child resistant packages have a closure with an exposed sidewall that is intended to be gripped by the consumer for the purpose of opening and or closing the package. Because this invention does not have an exposed closure sidewall it relies upon frictional engagement between the palm of a consumers hand and the closure top panel, to rotate the closure, with respect to the container, for the purpose of removing it from the container. Specifically, to open the package, the consumer places the palm of one hand on the closure and rotates this hand in the counter clockwise direction, while the container is kept stationary with the

other hand. This action causes the closure to be unscrewed from the container. Pressing one's palm on the top of the closure is specifically for the purpose of frictional engagement and is not used to move the closure axially toward the container to engage or disengage any appendage or mechanism used to provide child resistant means as is the case with many inventions in the prior art.

The cooperating means used for attaching the closure to the vial can be located on the outer surface of the closure sidewall; and on the inner surface of the vial sidewall at or near its opening. Such means, could be cooperating screw threads on the closure and container such that rotating the closure with respect to the container is the action necessary to open or close the package. While screw threads are a common and effective means for retaining a closure on a container this invention is not limited to the use of screw threads.

Alternate means such as engaging beads on the inner surface of the container and an external surface of the closure could be used to retain the closure within the vial. A ramp like projection on the inner surface of the vial and a cooperating spline on the exterior surface of the closure side wall could be used to cam the closure out of engagement with the container when the closure is rotated with respect to the container. That is, when the spline on the closure is in contact with the ramp in the container and the closure is rotated, the spline will elevate as it moves up the ramp, thereby moving the closure upward at this location, thus moving the closure and container retention means out of engagement. Once the closure has been rotated a sufficient number of degrees as to elevate it above the plane of the container opening, one could now have a sufficient amount of the closure top panel exposed so that they could now lift the closure from the container.

Another possibility would be to have more than one ramp and or spline arranged in such a manner so as to completely cam the closure off of the container when the closure is rotated.

Another version of the retention means could employ the periphery of the closure top panel and an internal bead on the container near its open end, along with a ledge, slightly below the bead, upon which the bottom surface of the closure top panel could rest. The container bead and the ledge below the bead would have an internal diameter that is less

than the outer diameter of the closure top panel. Closing the package would consist of inserting the closure sidewall into the container until the closure top panel passes under the container bead and rests on the container ledge. Removal of the closure from the container could be accomplished by the spline and ramp discussed previously. One can easily comprehend that a great many variations in the construction of this invention can be made by those skilled in the art and still remain within the scope of this disclosure. Pictorial or written instructions on the method to be used for opening the package may appear on the package. While it is intended that instructions for opening the package be included with the package, it is anticipated that most consumers could open the package before reviewing the instructions because of their conditioning for pushing and turning a child resistant closure to remove it from a container.

Since the closure lacks an exterior sidewall the amount of torque that can be exerted upon it during the application process would be limited by the frictional contact between the application medium and the top surface of the closure, to a relatively low level. Because of the relatively low level of application torque, the amount of removal torque required to loosen and remove the closure will also be relatively low. These relatively low levels of application and removal torque required to use the package, will translate into a consumer friendly package.

While it is anticipated that the majority of consumers would be capable of opening the package by frictional engagement between their hand and the top of the closure, not all consumers may be capable of accomplishing this task. To aid these consumers a slot is formed in the top panel of the closure. This slot is of such dimension that a tool such as a coin or key, for example, can be partially inserted into the slot for the purpose of using the tool for rotating the closure to remove it from the container.

The surface of the closure top panel may be smooth or have projections and or depressions to enhance the degree of frictional contact of the closure by the consumer. The preferred means for retaining the closure in the container and removing the closure from the container are expected to be screw threads on the closure and in the container. There may be a single thread on both the closure and container or there may be multiple threads on each without detracting from this disclosure.

A sealing system composed of contact between surfaces on the closure and vial, for the purpose of preventing the ingress and or egress of air, moisture, or other substance, can be added by those skilled in the art, and still remain within the scope of this disclosure.

## DESCRIPTION OF DRAWINGS

FIG. 1 is a side view of the package showing the container and closure.

FIG. 2 is a top view of the package showing the closure inserted into the container.

FIG. 3 is a side view of the closure showing its top panel and depending sidewall.

FIG. 4 is a section as shown in FIG. 2 along line 4-4.

FIG. 5 is a perspective view of the package showing the closure and container.

FIG. 6 is a top view of the container showing an alternative ramp construction.

FIG. 7 is a sectional view of the container shown in FIG. 6 along line 7-7

FIG. 8 is a side view of the closure used in the ramp construction with the spline in front.

FIG. 9 is a side view of the closure used in the ramp construction with the spline on the side.

FIG. 10 is an enlarged view of the area within circle A in FIG. 7.

## DETAILED DESCRIPTION OF THE INVENTION

Referring to drawing FIG. 1, 1-5 shows the package 1 being composed of container 2 and closure 3. The container 2 is composed of a base 13 integrally connected to generally cylindrical sidewall 11 that is integrally connected to the upper generally cylindrical sidewall 10 via generally conical transitional wall 5. The upper sidewall 10 is larger in diameter than the lower sidewall 11 and screw thread 9, for retaining the closure, is contained on its inner surface.

The closure 3 is composed of a generally circular top panel 13 that is smaller in diameter than the outer diameter of the container upper sidewall 10; has a flat lower surface 14 and a convex upper surface 12 with these two surfaces joining at the periphery of the closure. The sidewall 4 depends from and is integral with the lower surface 14. This closure sidewall 4 is generally cylindrical with its external surface being smaller in diameter than the interior of container sidewall 10 and it contains a screw thread 6 which cooperates with container screw thread 9 to retain the closure within the container. The bottom surface 7, of the closure sidewall 4, is generally conical in cross section as it connects the outer and inner surfaces of the sidewall. Contact between the inner surface of container transitional wall 5 and closure bottom surface 7 is anticipated as being capable of sealing the package when the closure is applied to the container.

The closure 3 is applied to the container 2 by grasping the closure at its periphery, inserting it partially into the container, and rotating the closure with respect to the container to engage their screw threads. When closure screw thread 6 has become engaged with container screw thread 9 the consumer can complete application of the closure by using their palm to contact the convex surface 12 and rotate it in the clockwise direction until the closure is fully applied. Removal of the closure 3 from the container is the reverse of the application process. The consumer presses their palm against the convex upper surface 12 of the closure with sufficient force such that rotating ones hand in the counter clockwise direction will loosen and partially remove the closure from the container. One can then grasp the closure 3 at its periphery and continue to rotate it counter clockwise, or they may continue to use rotation of their palm, to complete the removal process.

Those consumers that find it difficult to open the package using the process described above can use a tool such as a coin inserted into slot 8 in the top panel 12 of the closure. They can then use the tool to rotate the closure 3 to open and or close the package. While screw threads on the interior of the container 2 and the exterior of closure 3 are the preferred retention means, alternate means of retaining the closure within the container are possible.

One alternate means is shown in FIGS 6-10. The preferred embodiment incorporates screw threads for retaining the closure within the container and elevating the closure out of the container. This concept consists of separate parts for closure retention, and closure elevation. The package is closed by inserting the closure 24 into the container 20 to the point where the top panel 25 cams past container bead 28 and the closure bottom surface rests upon container surface 21. The interior diameter of continuous bead 28 is smaller than the exterior diameter of closure top panel 25 and thereby retains the closure within the container. To open the package the closure 24 is rotated in a counter clockwise direction using ones palm. At one point during this rotation the bottom 30 of spline 27 protruding from sidewall 26 of closure 24 will contact the upper surface 23 of cam 22 on the inner surface of container sidewall 31. Continued rotation of the closure will cause the closure to tilt and elevate with respect to the container as the spline 27 rides up cam 22 thereby moving the closure top panel 25 past container bead 28 which disengages the

retention means allowing the closure to be grasped and pulled completely from the container. One could term this concept as being a “Push On –Turn Open” package; meaning that one closes the package by simply pushing the closure into the container and opens the package by turning the closure. This is unique to child resistant packaging and unique to packaging in general to have a closure that does not have an exposed surface that can be gripped when the closure is fully applied to the container.